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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/938,982	08/24/2001	Ravi Murthy	257/062	3330

23639 7590 04/08/2004  
BINGHAM, MCCUTCHEN LLP  
THREE EMBARCADERO, SUITE 1800  
SAN FRANCISCO, CA 94111-4067

EXAMINER
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VEILLARD, JACQUES

ART UNIT	PAPER NUMBER
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2175

DATE MAILED: 04/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/938,982

Applicant(s)

MURTHY ET AL.

Examiner

Jacques Veillard

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 and 24-33 is/are rejected.
- 7) ☒ Claim(s) 21-23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This action is responsive to the Applicant's communication filed on 8/24/2001.
2. Claims 1-33 are pending and presented for examination.
3. Claims 1,32 and 33 are the independent claims. Other claims are the dependent.

### ***Information Disclosure Statement***

4. The information disclosure statement (IDS) submitted on 11/03/2003 (Paper No.6) and 12/01/2003 (Paper No.7) was filed after the mailing date of the application on 8/24/2001. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Drawings***

5. The drawings are objected to because the phrase "DETERMINE DEGREE OF PARALLEL IS ON" at step (602 in Fig.6) is obvious different from the citation at page 23, lines 21-22. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
6. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 1, the claim recites the limitation "a table function" in line 2. It is not clear whether Applicant is referring to the "a table function" mentioned in line 1 or to a different "a table function". This language renders the claim indefinite.

As per claims 2-31, they are suffering the same defect as their base claim. Therefore, they are also rejected for the same reason in virtue of dependency.

9. Claims 1, 32, and 33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite because the preamble recites "a method for pipelining a table function in a database". However, the claim is silent on the steps to have arrived with "a method for pipelining a table function in a database". Applicant is required to amend the claims so that they recite steps that would arrive with a method, system and process for pipelining tables.

As per claims 2-31, they are suffering the same defect as their base claim. Therefore, they are also rejected for the same reason in virtue of dependency.

***Claim Rejections - 35 USC § 102***

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 1-6, 13-17, 20, 24, 32, 33 rejected under 35 U.S.C. 102(b) as being anticipated by Cheng et al.(U. S. Pat. No. 5,241,648, hereinafter Cheng).

As per claim 1, Cheng discloses a hybrid technique for joining tables which is similar to the Applicant's method for pipelining a table function in a database system (See the abstract, and col.5, lines 19-32). In particular, Cheng's technique comprising: a) performing a setup operation when a table function is a called (See col.6, lines 8-33); b) fetching a subset of output data from a data producer (See col.6, lines 40-52, and col.9, lines 24-45); c) sending the subset of the output data to a first consumer of the output data, wherein the first consumer is the table function (See col.6, line 55 through col.7, line 68); d) repeating steps b) and c) until all the output data has been fetched from the data producer (See col.8, line 1 through col.9, line 45).

As per claims 32 and 33, the claims have substantially the same limitations as claim 1. These limitations have already been addressed in the rejection of claim 1. Therefore they are rejected on similar grounds corresponding to the arguments given for the rejected claim 1 above.

As per claim 2, Cheng discloses the claimed invention in which the act of performing a setup operation comprises setting up a context object to maintain state (See col.10, lines 18-40).

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As per claim 3, Cheng discloses the claimed invention in which the data producer comprises a second table function (See Figs.2, 3, and 4, element 10).

As per claim 4, Cheng discloses the claimed invention in which the subset of the output data comprises a single data object or row of data (See col.10, lines 20-25).

As per claim 5, Cheng discloses the claimed invention in which the subset of the output data comprises a plurality of data objects or rows of data (See abstract, col.2, lines 41-63, and col.7, lines 58-68).

As per claim 6, Cheng discloses the claimed invention further comprising: e) performing a close operation after all the output data has been fetched from the data producer (See col.6, lines 38-39, and col.9, lines 24-44).

As per claim 13, Cheng discloses the claimed invention in which the data producer comprises a dynamically configurable return type (See col.10, lines 9-10, and lines 33-35).

As per claim 14, Cheng discloses the claimed invention in which the dynamically configurable return type is established at compile time (See col.3, lines 22-25, and col.6, lines 40-42).

As per claim 15, Cheng discloses the claimed invention in which steps a) through d) are implemented within a database query language statement (See col.3, lines 53-68).

As per claim 16, Cheng discloses the claimed invention in which the database query language statement comprises SQL (See col.6, lines 34-37).

As per claim 17, Cheng discloses the claimed invention in which the subset of the output data is pipelined to a database query language statement (See col.5, lines 24-27, lines 31-33, lines 53-59, and col.9, lines 14-16).

As per claim 20, Cheng discloses the claimed invention further comprising: e) send the subset of the output data to a second consumer of the output data (See col.8, lines 1-16).

As per claim 24, Cheng discloses the claimed invention in which the first consumer processes the subset of the output data in parallel (See col.5, lines 21-24, and col.9, lines 11-16).

### ***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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13. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al. (U. S. Pat. No. 5,241,648, hereinafter Cheng) in view of Huelsbergen et al. (U. S. Pat. No. 6,052,699, hereinafter Huelsbergen).

As per claim 7, Cheng teaches a hybrid technique in which a close operation act is performed (See col.6, lines 38-39, and col.9, lines 24-44). Cheng does not explicitly teach the technique wherein the close operation comprises garbage collection operations.

However, Huelsbergen teaches a garbage collection technique for the concurrent operation of a mutator and garbage collector (See abstract, col.1, lines 11-13, col.4, lines 26-30, col.5, lines 45-49, and col.6, lines 15-64).

It would have been obvious for a person of ordinary skill in the art at the time of the Applicant's invention was made to modify the teachings of Cheng with the teachings of Huelsbergen to include a garbage collection operation because Huelsbergen provides a garbage collection technique which allows for full concurrency between mutation, marking and sweeping without the need for fine-grain synchronization.

As per claim 8, the combination of Cheng and Huelsbergen, as modified, teaches the claimed invention in which the garbage collection operations comprises removal of a context object (See Huelsbergen's col.7, line 57 through col.8, line 9, and col.14, line 54 through col.15, line 15).

As per claim 9, the combination of Cheng and Huelsbergen, as modified, teaches the claimed invention in which the table function executes in a different execution thread than the



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data producer (See Huelsbergen's Fig.2 component 210 and corresponding text, and col.4, lines 30-32).

As per claim 10, the combination of Cheng and Huelsbergen, as modified, teaches the claimed invention in which the table function and the data producer execute from an identical execution thread (See Huelsbergen's col.3, line 62 through col.4, line 4).

14. Claims 11, 12, 17, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al. (U. S. Pat. No. 5,241,648, hereinafter Cheng) in view of Danneels et al.(U. S. Pat. No. 5,410,698, hereinafter Danneels).

As per claim 11, Cheng teaches a hybrid technique for joining tables which is similar to the method of claim 1. Cheng does not teach a technique in which a callback function is passed from the table function.

However, Danneels teaches a method for loading software libraries including a callback function(See col.20, line 58 through col.22, line 4, and col.23, line 44 through col.24, line 56).

It would have been obvious for a person of ordinary skill in the art at the time of the Applicant's invention was made to modify the teachings of Cheng with the teachings of Danneels to include a callback function because Danneels teaches a method to provide multicasting on a computer network wherein a callback function type is used to notify user of asynchronous events.

As per claims 12, 18, and 19, the combination of Cheng and Danneels, as modified, teaches the claimed invention in which the callback function is executed on each subset of the output data fetched from the data producer and filters inappropriate data (See Danneels's col.20, line 58 through col.22, line 4, and col.23, line 44 through col.24, line 56, col.28, lines 30-68).

15. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al. (U. S. Pat. No. 5,241,648, hereinafter Cheng) in view of Kametani et al. (U. S. Pat. No. 4,803,613, hereinafter Kametani).

As per claims 25 and 26, Cheng teaches a technique for joining tables similar to claim 1. Cheng does not explicitly teach the technique as claimed in claim 25 and 26 in which multiple slaves exist to process the subset of the output data and determining which of the multiple slaves operate upon the subset of the output data.

However, Kametani, teaches a decentralized master-slave control in which multiple slaves exist to process the subset of the output data and determining which of the multiple slaves operate upon the subset of the output data (See abstract, Fig. 2 and corresponding text, col.1, line 62 through col.2, line 36, and col.3, line 25 through col.4, line 68),.

It would have been obvious for a person of ordinary skill in the art at the time of the Applicant's invention was made to modify the teachings of Cheng with the teachings of Kametani to include a master slave system because Kametani provides a system which has sufficient flexibility and expansibility with respect to both hardware and software wherein each of the slave module is allocated to one of the controlled elements and has its own processor which interprets and executes commands for the controlled element allocated thereto.

As per claims 27 and 28, the combination of Cheng and Kametani, as modified, teaches the claimed invention in which a partitioning definition is established to route the subset of the output data to an appropriate one of the multiple slaves and comprises either hash or range based partitioning (See Kametani's col.5, line 4-through col.6, line 64, and col.8, line 18 through col.col.9, line 66).

16. Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al. (U. S. Pat. No. 5,241,648, hereinafter Cheng) in view of Sheffield et al.(U. S. Pat. No. 5,937,415, hereinafter Sheffield).

As per claim 29, Cheng teaches an hybrid technique for joining tables which is similar to the method of claim 1.Cheng does not explicitly teach the technique further comprising: optimizing a query comprising the table function.

However, Sheffield teaches a client/server database system for performing database queries includes optimizing a query comprising the table function (See col.2, lines 42-59, Fig.2 element 266, and col.7, lines 26-32).

It would have bee obvious for a person of ordinary skill in the art at the time of the Applicant's invention was made to modify the teachings of Cheng with the teachings of Sheffield to include a query optimizer because provides a system to processing of queries against information stored in a data processing system, such as an SQL Relational Database Management system by using an optimizer to select the join order of tables wherein the data pipeline lets a user easily move data from a high-end database to local database.

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As per claims 30 and 31, the combination of Cheng and Sheffield, as modified, teaches the claimed invention in which statistics for the table function are passed to an optimizer and self-determines statistics to optimize the query (See Sheffield's col.7, lines 1-32).

***Allowable Subject Matter***

17. Claims 21-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

18. The following is a statement of reasons for the indication of allowable subject matter: The prior taken singularly or in combination fail to teach or suggest a system or method further comprising the step of determining whether the subset of the output data should be routed to the first consumer or the second consumer; executing step c) if the subset of the output data should be routed to the first consumer; and executing step e) if the subset of the output data should be routed to the second consumer as recited in dependent claim 21.

***Other Prior Art Made of Record***

19. Schwartz et al.	U. S. Pat. No. 6,421,342,
Santosuosso et al.	U. S. Pat. No. 6,701,520,
Poulsen et al.	U. S. Pat. No. 5,812,852,
Srinivasan	U. S. Pat. No. 5,765,159, and
Tock	U. S. Pat. No. 5,815,718.

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20. **Any response to this action should be mail to:**

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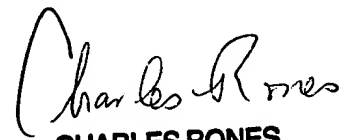
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Hand - delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington.

VA, Fourth Floor Lobby (Receptionist Telephone No. (703) 305-3900).

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacques Veillard whose telephone number is (703) 305-7094. The examiner can normally be reached Monday through Friday from 9:30 AM to 4: 30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dov Popovici, can be reached on ( 703) 305-3830. The fax phone number for this group is (703) 308-5403.

  
**CHARLES RONES**  
**PRIMARY EXAMINER**



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Jacques Veillard  
Patent Examiner TC 2100

March 30, 2004